

What is claimed is:

- 5 1. An isolated, vertebrate nucleic acid molecule of bcl-6 locus.
2. A DNA molecule of claim 1.
3. A cDNA molecule of claim 2.
- 10 4. A genomic DNA molecule of claim 2.
5. An RNA molecule of claim 1.
- 15 6. A human nucleic acid molecule of claim 1.
7. A nucleic acid molecule comprising a nucleic acid molecule of at least 15 nucleotides capable of specifically hybridizing with a sequence included within the sequence of the nucleic acid molecule of the bcl-6 locus.
- 20 8. A DNA molecule of claim 7.
- 25 9. An RNA molecule of claim 7.
10. An isolated, vertebrate nucleic acid molecule of claim 3 operatively linked to a promoter of RNA transcription.
- 30 11. A vector which comprises the nucleic acid molecule of claims 2 or 10.
12. A vector of claim 11, wherein the isolated nucleic acid molecule is linked to a plasmid.
- 35 13. The nucleic acid molecule of claim 12 designated

pGB31 (ATCC Accession No. 75476).

14. The nucleic acid molecule of claim 12 designated pGB3s (ATCC Accession No. 75477).

5 15. A host vector system for the production of a polypeptide encoded by bcl-6 locus, which comprises the vector of claim 11 in a suitable host.

10 16. A host vector system of claim 15, wherein the suitable host is a bacterial cell, insect cell, or animal cell.

15 17. A method of producing a polypeptide encoded by bcl-6 locus, which comprises growing the host vector system of claim 11 under suitable conditions permitting production of the polypeptide and recovering the polypeptide so produced.

20 18. A polypeptide encoded by the isolated, vertebrate nucleic acid molecule of claim 1.

25 19. An antibody capable of binding to polypeptide encoded by bcl-6.

20. A monoclonal antibody of claim 19.

30 21. A polyclonal antibody of claim 19.

22. The isolated nucleic acid molecule of claim 1 that is labelled with a detectable marker.

35 23. The isolated nucleic acid molecule of claim 22, wherein the marker is a radioactive label, a calorimetric, luminescent, or a fluorescent

marker.

24. An antagonist capable of blocking the expression of claim 18.

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25. The antagonist of claim 24, wherein the antagonist is a triplex oligonucleotide capable of hybridizing to nucleic acid molecule of claim 1.

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26. An antisense molecule capable of hybridizing to the nucleic acid molecule of claim 1.

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27. The antisense molecule of claim 26, wherein the molecule is a DNA.

28. The antisense molecule of claim 26, wherein the molecule is a RNA.

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29. A triplex oligonucleotide capable of hybridizing with a double stranded DNA molecule of claim 2.

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30. A transgenic nonhuman mammal which comprises the isolated nucleic acid molecule of claim 1 introduced into the mammal at an embryonic stage.

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31. An assay for non-Hodgkin's lymphoma, comprising (a) incubating a sample of suitable body fluid for a subject with a monoclonal antibody reactive with non-Hodgkin's lymphoma cells to a solid support, (b) removing unbound body fluid from the support, and (c) determining the level of antigen activity exhibited by the bound body fluid to the support.

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32. A method for screening putative therapeutic

agents for treatment of non-Hodgkin's lymphoma, which comprises determining in a first sample from a subject with non-Hodgkin's lymphoma the presence of the isolated nucleic acid molecule of claim 1, administering to the subject a therapeutic amount of the agent such that the agent is contacted with the cell associated with the condition, determining after a suitable period the amount of the isolated nucleic acid molecule in a sample from the treated subject, and comparing the amount of isolated nucleic acid molecule determined in the first sample with the amount determined in the sample from the treated subject, a difference indicating the effectiveness of the agent, thereby screening putative therapeutic agents for treatment of non-Hodgkin's lymphoma.

33. A method for diagnosing B-cell lymphoma in a subject comprising:

- (a) obtaining DNA sample from the subject;
- (b) cleave the DNA sample into fragments;
- (c) separating the DNA fragments by size fractionation;
- (d) hybridizing the DNA fragments with a nucleic acid molecule comprising a nucleic acid molecule of at least 15 nucleotides capable of specifically hybridizing with a sequence included within the sequence of the nucleic acid molecule of the bcl-6 locus to detect the DNA fragment containing the bcl-6 sequence; and
- (e) comparing the detected DNA fragment from (d) with the DNA fragment from a known normal subject, the difference in size of the fragments indicating the occurrence of B-

cell lymphoma in the subject.

34. A method of claim 33, where in step (b), the DNA sample is cleaved by restriction enzyme.

35. A method of claim 33, wherein the size fractionation in step (c) is effected by a polyacrylamide or agarose gel.

36. A method of claim 33, where in step (d), the nucleic acid molecule is labeled with a detectable marker.

37. A method of claim 36, wherein the detectable marker is a radiolabelled molecule, a fluorescent molecule, an enzyme, or a ligand.

38. A method of claim 33, further comprising transferring the DNA fragments into a solid matrix before step (d).

39. A method for diagnosing B-cell lymphoma in a subject comprising:

- (a) obtaining RNA sample from the subject;
- (b) separating the RNA sample into different species by size fractionation;
- (c) hybridizing the RNA species with a nucleic acid molecule comprising a nucleic acid molecule of at least 15 nucleotides capable of specifically hybridizing with a sequence included within the sequence of the nucleic acid molecule of the bcl-6 locus to detect the RNA species containing the bcl-6 sequence; and
- (d) comparing the detected RNA species from step (c) with the RNA species from a known normal

subject, the difference in size of the species indicating the occurrence of B-cell lymphoma in the subject.

- 5      40. A method of claim 39, wherein the size fractionation in step (b) is effected by a polyacrylamide or agarose gel.
- 10      41. A method of claim 39, where in step (c), the nucleic acid molecule is labeled with a detectable marker.
- 15      42. A method of claim 41, wherein the detectable marker is a radiolabelled molecule, a fluorescent molecule, an enzyme, or a ligand.
- 20      43. A method of claim 39, further comprising transferring the RNA species into a solid matrix before step (c).
- 25      44. A method of treating a subject with non-Hodgkin's lymphoma, comprising administering an effective amount of the antisense molecule of claim 26 operatively linked to a suitable regulatory element coupled with a therapeutic DNA into a tumor cell of a subject, thereby treating the subject with non-Hodgkin's lymphoma.
- 30      45. A method of treating a subject with non-Hodgkin's lymphoma, comprising administering an effective amount of the antagonist of claim 23, and a suitable acceptable carrier, thereby treating the subject with non-Hodgkin's lymphoma.

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